



# **Introduction to Casualty and Aeromedical Evacuation**



# Objectives

---

- ✦ **Describe medical care for Level 1 & 2**
  - **Identify medical providers at each level**
- ▯ **Patient transportation capabilities**
- ▯ **Modes of Transport**
- ▯ **How is AE system designed and accessed**

# Theater Paradigm

---

## ✦ Levels of Care

- **Five, with two to three in theater, each with increasing levels of sophistication**
  - ◆ **Trauma/preventive med based**
  - ◆ **Determined by battle & access to evacuation**
  - ◆ **Purpose: Stabilize, essential care, and evacuate**

## ▢ Medical evacuation assets

- ◆ **Rolling stock**
- ◆ **Rotary wing**
- ◆ **Fixed wing**

# Evacuation by Level

---

- ✦ **Injury to Level I**
  - **Organic vehicles: No medical capability**
- ▢ **Level I to II**
  - **Ambulances, ships, aircraft through Services with medical capability**
- ▢ **Level II to III - Service unique or USTRANSCOM**
- ▢ **Level II to V - Coordinated by medical regulating offices (MRO & JPMRC)**
  - **May be ground, rotary, fixed wing**

# Level I

---

- ▮ **Care rendered at Unit level**
  - **Self aid buddy care/combat life saver**
  - **Maintain ABC. May include:**
    - **Physical restoration of airway**
    - **Use of IV fluid and antibiotic**
    - **Application of splint and bandage**
  - **Evacuation provided by supporting unit**

# Level II

---

- ✦ **At minimum, care is physician-directed resuscitation and stabilization**
  - **May include:**
    - **advanced trauma management**
    - **emergency medical procedures**
    - **forward resuscitative surgery**
  - **First level where red blood cells are available**
  - **Limited patient hold**
  - **X-ray, dental, basic lab, limited pharmacy**
  - **Evacuation provided by AE or support unit**

# Level III

---

- ✦ **First full in-patient capability**
  - **Holds patients for extended periods**
  - **Pre-op; general anesthesia; surgery; post-op**
  - **Range of blood products (FFP, Plat; ABO)**
  - **Examples: CSH; Hospital ships (MERCY/COMFORT) and Fleet Hospitals; 10-25 bed EMEDS**

# Level IV & V

---

- ▮ **Echelon/Level IV: Fixed, outside of area of joint operations**
  - **Army, Navy, AF, coalition fixed hospitals**
  - **Field Hospital/Fleet Hospital**
- ▮ **Echelon/Level V: CONUS military, VA, and/or NDMS beds**



# Summary

---

## ✦ Army

- IBAS
- II      Med Company  
            with FST
- III      CSH
- IV      Field Hospital,  
            General Hosp
- V      CONUS

## ▢ Marines

- IBAS
- II      C&C Co  
            Surgical Sup
- Navy supplies  
  other support

# Summary

---

## ✦ Navy

- **ICare Afloat**
- **II Ships convert for casualties**
- **III Hospital ships**  
**Fleet Hospital (small)**
- **IV Fleet Hospital (larger)**

## ▯ Air Force

- **I SABC**
- **II SPEARR**  
**EMEDS**  
**Basic**
- **III EMEDS 10-25**
- **IV Theater Hospital**

# Objectives

---

- ✦ **Describe the differences between CASEVAC and MEDEVAC**
- ▢ **Discuss the role of CASEVAC in tactical planning**
- ▢ **Evaluate the efficacy of the various options for transport and the effect of these decisions upon patient care**

# CASEVAC *versus* MEDEVAC

---

- ✦ “MEDEVAC” often used when describing the air evacuation of wounded combat personnel from the battlefield with or without medical capabilities onboard
- The term MEDEVAC is primarily used to distinguish the movement of patients or wounded by Rotary-Wing assets.
  - Air Force reserves the term “AEROEVAC” or “AIR EVAC” for the aeromedical evacuation (A/E) of a stable patient from one medical facility to another by Fixed-Wing aircraft.

# CASEVAC *versus* MEDEVAC

---

- ✦ **Avoid the term “MEDEVAC” when discussing the initial movement of combat casualties out of the tactical environment when not using dedicated resources.**
- ▮ **Use the term "Combat Casualty Evacuation" or “CASEVAC” to eliminate any misunderstanding of the mission required.**

# Common Evacuation Platforms

## Manual or litter carry

---



### **PRO's:**

- ✦ **Immediately available under virtually all circumstances**
- ▮ **No equipment absolutely required**
- ▮ **Close proximity to casualty throughout transportation**

# Common Evacuation Platforms

## Manual or litter carry

---



### CON's:

- ✦ **Must use what is at hand for litter**
  - **Prefabricated litter bulky to bring along**
  - **Field-expedient materials may be weak**
- ▢ **Carries might preclude other tasks by carriers (*e.g.*, weapons)**
- ▢ **No protection of casualty against weather, enemy fire, CBRN, *etc.***
- ▢ **Tiring to move casualties for long distances**



# Common Evacuation Platforms

## ~~Field-expedient ground vehicle~~



### PROs:

- ✦ Able to move several casualties long distances depending on fuel
- ▢ Able to convoy for protection
- ▢ Ambulances usually have
  - Dedicated medical personnel & equipment so casualty's unit doesn't have to give up
  - Room to deliver care *en route* depending on size and number of casualties
  - Protection of casualties from elements
  - Internal light source



# Common Evacuation Platforms

## Front-line ambulance (FLA)

---



### CON's:

- ✦ **Vehicle and casualty must be collocated in order to load**
- ▢ **Cannot avoid adverse terrain**
  - **Road conditions**
  - **Enemy action, mines**
- ▢ **Bouncing and rocking may be detrimental to casualty**
- ▢ **Some field-expedient vehicles are not enclosed or covered**

# Common Evacuation Platforms

## ~~Rotary-wing aircraft~~



### **PRO's:**

- ▢ **Speed, range, terrain avoidance**
- ▢ **Does not have to be next to casualty on ground to load**
- ▢ **Easy to bypass next echelon when casualty status warrants**
- ▢ **Can be armed for self-protection**
- ▢ **Capacity usually larger than FLAs**
- ▢ **More efficient casualty flow**

# Common Evacuation Platforms

## ~~Rotary-wing aircraft~~

### CON's:

- ✦ May be grounded for maintenance, weather, AAA, or CBRN reasons

### Altitude considerations

- Decreased  $p_{AO_2}$
- Decreased ambient pressure

### Casualty stressors

- Decreased humidity
- Colder with altitude (and possibly wind)
- Vibration
- Noise



# Common Evacuation Platforms

## Watercraft: Surface Boat

---



### **PRO's:**

- ✦ **Quicker and easier rescue from water than by rotary-wing aircraft**
- ▢ **Rapid extrication from beach terrain not accessible by ground**
  - **Lack of roads or difficult terrain**
  - **Enemy or mines blocking inland approach**
- ▢ **More sophisticated medical care may be closer off-shore**
- ▢ **Some armed for self-protection**



# Common Evacuation Platforms

## Watercraft: Surface Boat

---



### CON's:

- ✦ **Palpation and auscultation not possible at speed**
- ▮ **Frequent splashing and high-acceleration impacts make electronic monitoring cost prohibitive**
- ▮ **Casualties must be protected from impact trauma**

# Platforms

---



# Rotary Wing Platforms

---

- ✦ **UH 60 Blackhawk**
  - 4 litter/1 ambulatory
  - max 6 + 1 or
  - 7 ambulatory
- ▢ **UH 60 + Rescue Hoist**
  - 3-4 litter/1 ambulatory
  - or 4 ambulatory
- ▢ **UH 60Q**
  - Litter supports on wall
  - Lighting/med suction
  - Molecular sieve O2
    - 24L/min 94% O2



# Rotary Wing Platforms

---

- ✦ **UH-1H (Huey)**
  - **3 litter/4 ambulatory**
  - **Max 6 litter/9 amb**





# Rotary Wing Platforms

---

- ✦ **CH-47 Chinook**
  - **24 litter/31 ambulatory**



# Rotary Wing Platforms

---

## CH-53 (12 Litters)



# Fixed Wing Army

---

- ✦ **U-21 UTE**

- **3 litter/3 ambulatory or 10 ambulatory**

- ▣ **C-12 Huron**

- **2 litter/4 ambulatory or 8 ambulatory**

# Fixed Wing Air Force

---

## ✦ C-9 Nightingale

- Dedicated aircraft
- Pressurization
  - ♦ Sea level to 18,340 ft
- 40 litter/40 ambulatory





# Fixed Wing Air Force

---

## ✦ C-130

- 50 litter/27 amb
- or 74 litter
- or 92 amb



- Pressurization
  - ◆ Sea level to 19,500 ft

# Fixed Wing Air Force

---

## ✦ C-141 Starlifter

- 103 litter
- Or 168 ambulatory
- Or combination
- Pressurization
  - ◆ Sea level to 21,500 ft



# Fixed Wing Air Force

---

- ▮ **CRAF - Call up**
  - **87 short or 111 long litters**
  - **75 O2 sources/12 hr cap.**
  - **4 FN/6 Technicians**
  - **May augment crew**

# Fixed Wing Air Force

---

- ✦ **C-17**
  - **36 litter or 56 ambulatory**
  - **Or combination**
  - **Pressurization**
    - ◆ **Sea level to 21,500 ft**





# Priorities of Evacuation

---

## ✦ Army

- Urgent - 2 hr pickup
- Urgent Surgical
  - ◆ Immediate Surgery
- Priority - 4 hr pickup
- Routine - 24 hr pickup

## ✦ Air Force

- Urgent - Divert or launch aircraft
- Priority - 24 hr pickup
- Routine - 72 hr pickup
  - ◆ May travel 3-5 days

# Evacuation Chain



# AE MISSION AND GUIDANCE

---

## ✦ AE Mission

- Movement of Sick or Injured Personnel, by AE Crews/CCATTs on Fixed-Wing Aircraft, to Appropriate Medical Facilities

## ▢ Stabilized:

- ◆ Airway secured
- ◆ Hemorrhage Controlled/Shock treated
- ◆ Fractures stabilized
  - Within capability of medical unit

**AE is a Critical *Lifesaving* Link**

# THE AE SYSTEM

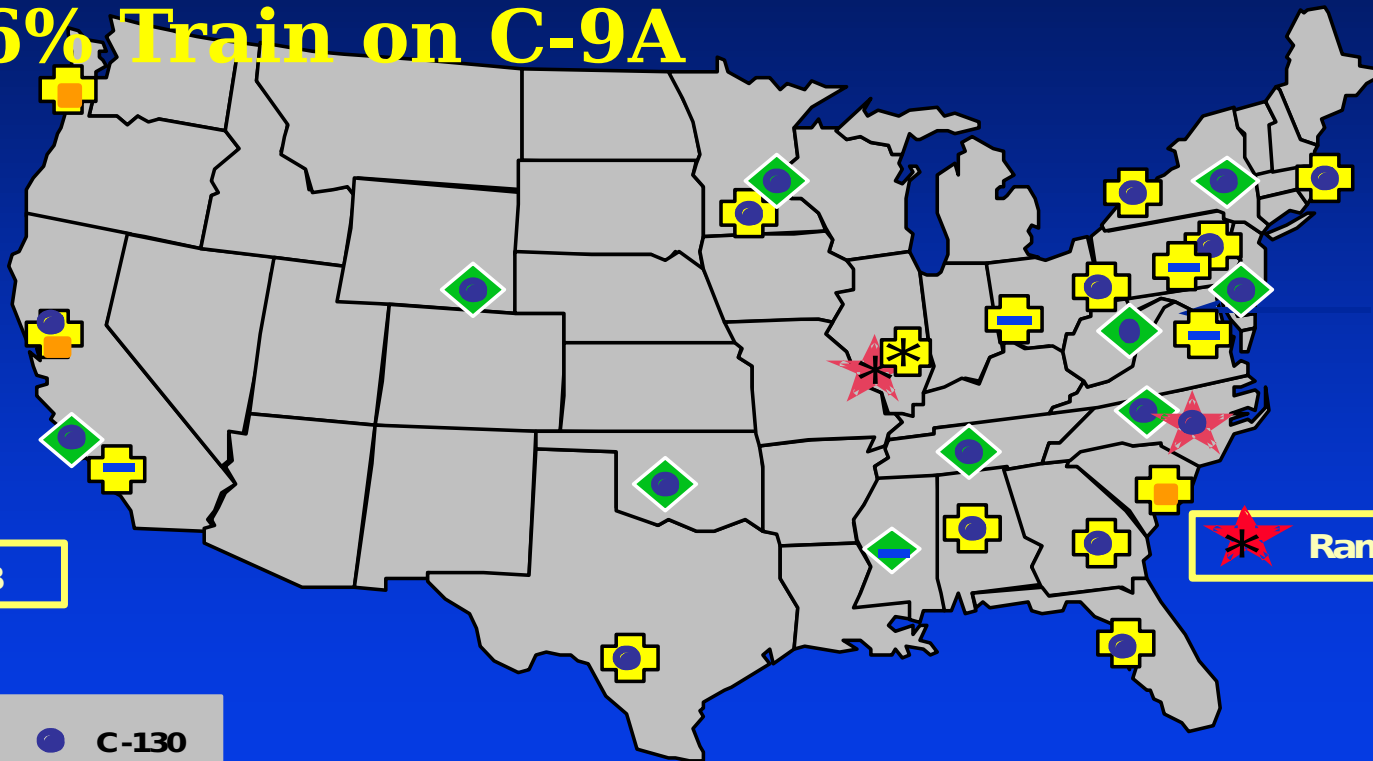
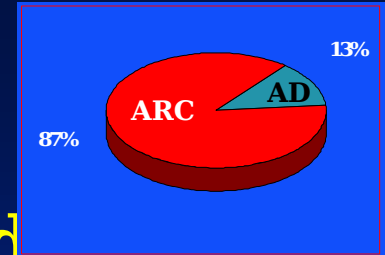
---

- ✦ **The AE System Provides**
  - **Control of Patient Movement by Air**
  - **Specialized Medical Aircrew and Augmentees**
  - **In-Flight Equipment**
  - **En-Route Facilities on or Near Air Strips for Care of In-Transit Patients**
  - **Communication Network**
  - **Patient Tracking (ITV)**

# THE AE SYSTEM FORCE STRUCTURE

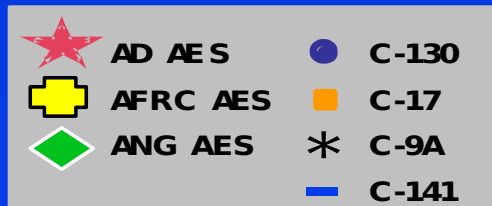
## ✦ 31 AE Squadrons Worldwide

- Operational Capability is 87%
- 94% Train on C-130, C-17, and C-141
- 6% Train on C-9A



✦ Yokota AB

✦ Ramstein AB



# AE TODAY

## Focus on C-9A Masks True Deficiency in AE Strategic Capability

- **Situation: Reduced Forward Medical Footprint**

- **Effect: Increased Need for Rapid AE**

- **Expectation: AE will Fill the Gap**

- **Reality: Reduced Strategic AE Capability**  
**Current Strategic AE Airframes**

- ✦ **48 Litter Capability C-141 was Workhorse - Retires 2006**

- ▮ **9 Litter Intrinsic Capability C-17 (Limited Quantity)**

- ▮ **No Litter Capability KC-135 and KC-10**

- ▮ **87 Litter Capability CRAF (Stage II Activation)**

# EQUIPMENT INITIATIVES

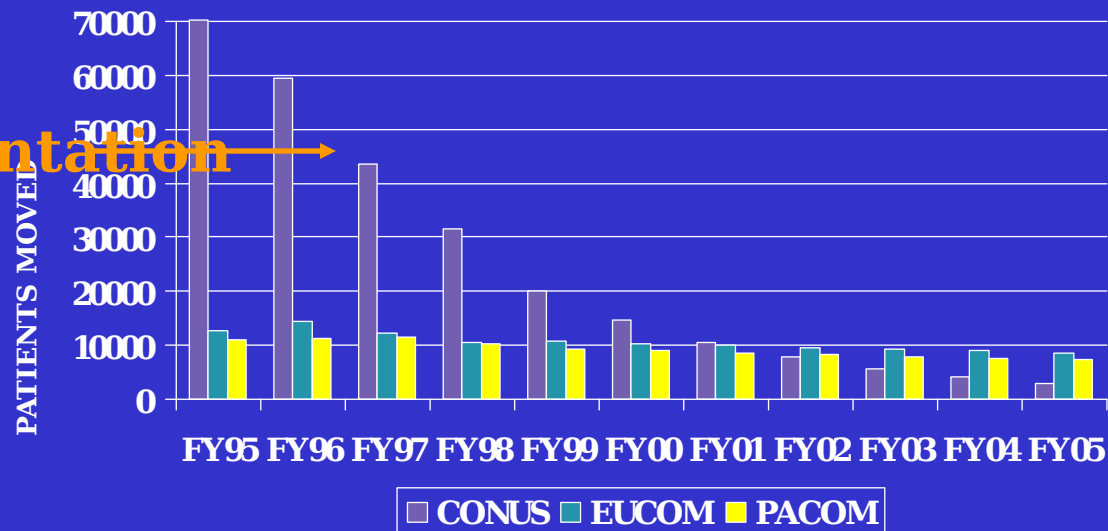
---

- ✦ **Patient Support Pallet**
  - **Provides / Expands Litter Capability**
    - ◆ **KC-135, KC-10, and C-17**
- ▢ **SPECTRUM Patient Care Module**
  - **Transport Single Urgent / Critical Care Patient on C-21 in PACAF/CONUS**
- ▢ **Patient Loading System**
  - **Access for High Deck Platform Aircraft**
    - ◆ **KC-135, CRAF 767, KC-10**

# AE TODAY PEACETIME REQUIREMENTS

- ✦ **CONUS Requirement Significantly Reduced**
  - TRICARE Major Impact
- ▣ **OCONUS Requirement Slightly Decreased**
  - TRICARE System in Infancy
  - Quality of Life
  - Reduced Medical Infrastructure

TRICARE Implementation →





# AE FOR TOMORROW

---

## ✦ Capability

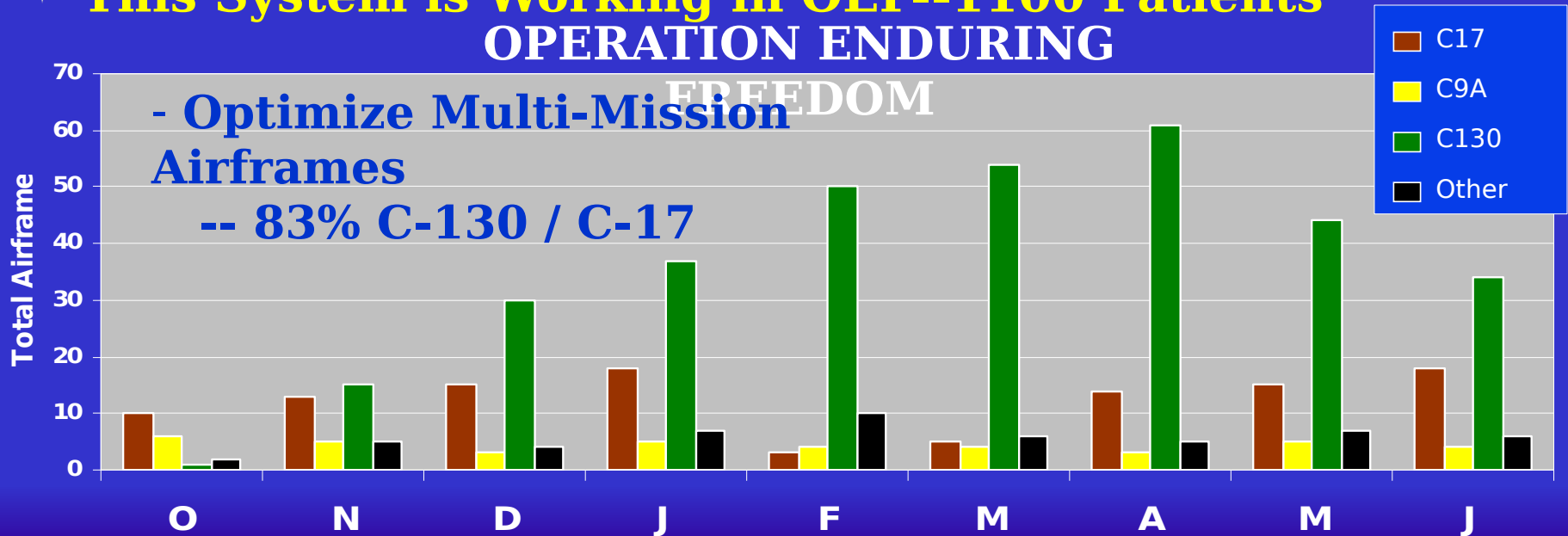
- **Transport Patients on Multi-Mission Airlift Across the Spectrum of Operations**
- **En-Route and In-Flight Patient Care**
- **Light, Mobile, Incremental UTCs**
- **In-Transit Visibility**

# HOW TO FILL THE C-9 GAP

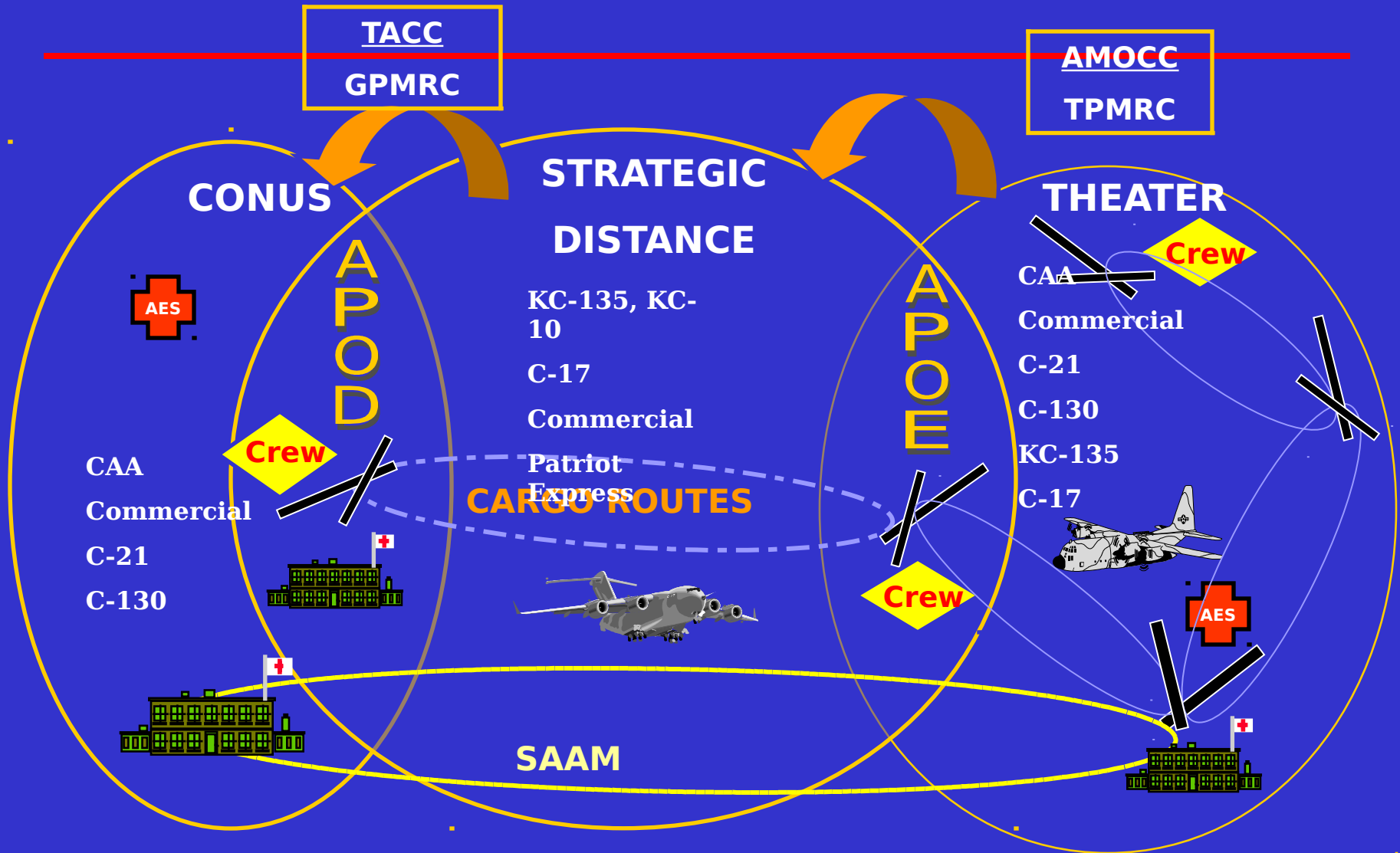
- ★ **Fully Incorporate AE into the Mobility System**
  - Validated Frequency-Based Channels
  - Requirements Based and Linked to Mobility Air Bridge
  - Stage AE Crews / Critical Care Air Transport Teams (CCATT) Forward
- ★ **This System is Working in OEF--1100 Patients**

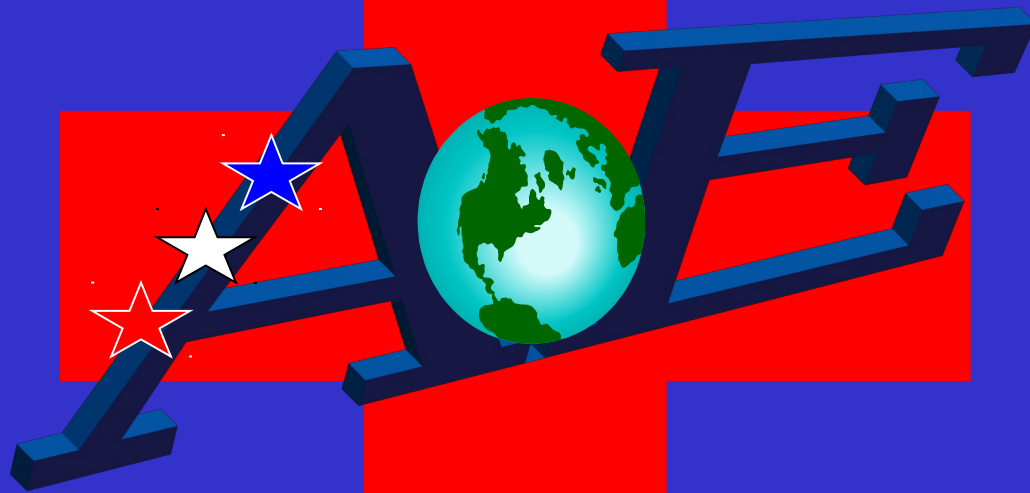
## OPERATION ENDURING

- Optimize Multi-Mission  
Airframes  
-- 83% C-130 / C-17



# FOR EXAMPLE...





*"Long-range planning does not deal with future decisions,  
but with the future of present decisions".*

~ Peter Drucker

